

NEW SPECIES OF MICROCADDISFLIES FROM THE  
AMAZON REGION, WITH ESPECIAL REFERENCE TO  
NORTHEASTERN PERU (TRICHOPTERA: HYDROPTILIDAE)

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*Abstract.*—Four new species of *Neotrichia*, *N. yanomonoa*, *N. sucusaria*, *N. yagua* and *N. juntada* and two new species of *Oxyethira*, *O. orellanai* and *O. teixeirai* are described from the upper Amazon region in Peru. Three additional new species of *Neotrichia*, *N. delgadeza* and *N. napoensis* from Ecuador and *N. cayada* from Venezuela are also described as they are closely related to the Peruvian specimens. A redescription of *N. filifera* from Uruguay is also included to clarify species relationships.

*Key Words:* Hydroptilidae, *Neotrichia*, *Oxyethira*, new species, Peru, Ecuador, Venezuela

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In January 1991, the junior author travelled to the upper Amazon region in Peru as part of an educational expedition sponsored by Samford University. While staying at the Explorama Lodge, on the Rio Yanomono, and the Explornapo Camp, on the Rio Sucusari, several collections of caddisflies were made with ultraviolet light traps. A second trip was made by LJD to the same locations in March 1991, as part of the First International Rain Forest Workshop, and additional material was collected.

The Explorama Lodge is located approximately 50 km NE of Iquitos on the Rio Yanomono, just upstream from its juncture with the Amazon or Marañon (3°23'S, 72°52'W). The Explornapo Camp is located about 70 km NNE of Iquitos (3°10'S, 72°54'W) on the Rio Sucusari (Fig. 1). The general area of these collections can be described as tropical floodplain forest, with water levels fluctuating up to 10 m per year.

This paper deals primarily with new species of Hydroptilidae collected in this region, but in some cases, in order to make comparisons to similar species, it was nec-

essary to reillustrate or describe species from other parts of northern South America. In total, seven new species of *Neotrichia* and two new species of *Oxyethira* are described herein. Morphological terminology follows that of Marshall (1979). Length is measured from the top of the head to the tip of the forewings and is given as a range with more than one specimen. Type material is deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

*Neotrichia yanomonoa*

Harris and Davenport, NEW SPECIES

Fig. 2

*Diagnosis.*—This species is most similar to *N. browni* Harris in genitalic features. Both species have thin elongate dorsolateral processes from the ninth segment, but *N. yanomonoa* is readily distinguished by the short inferior appendages which are acutely pointed on the inner margin.

*Description.*—*Male:* Length 1.4 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior margin rounded, posteroventral mar-

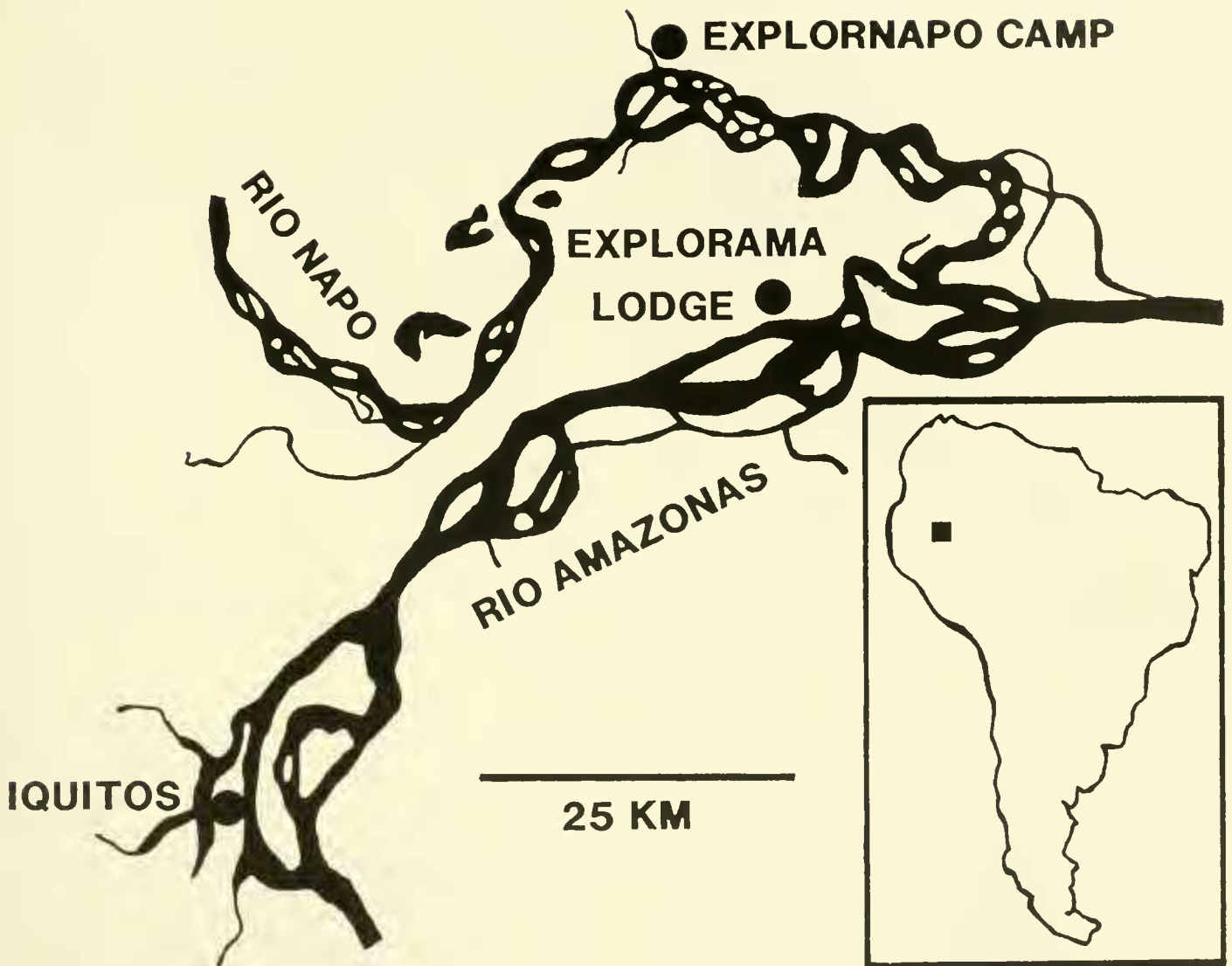


Fig. 1. Upper Amazon region in northeastern Peru.

gin extended into a long, truncate lobe, posterodorsal margin bearing elongate, thin sclerotized processes which converge posteriorly in dorsal and ventral views; square in ventral aspect, with narrow, elongate lateral extensions. Segment X fused with IX, in lateral view a thin sclerotized shelf over the elongate processes of segment IX; in dorsal view appearing as pair of rounded lobes, sclerotized distally, pair of small setiferous lobes anteriorly. Inferior appendages darkly sclerotized, short and narrow in lateral view, dorsoapically with several short spines; in ventral view somewhat triangular, truncate apically with inner margin produced into a point. Subgenital plate a rounded shelf in ventral view bearing pair of inwardly directed setae; sclerotized in lateral view, posterodorsal portion thin, bearing

seta apically, anteroventral portion thin and extending ventrad. Phallus with distal portion tapering apically, apex curved into narrow hook, smaller thin projection subapically; basal portion wide at base narrowing apically, bearing thin paramere encircling shaft.

Type material.—Holotype; Male. Peru, Loreto, small tributary to Rio Yanomono at Explorama Lodge, 13 January 1991, L. J. Davenport.

Etymology.—Named for the Rio Yanomono.

*Neotrichia cayada* Harris,  
NEW SPECIES

Fig. 3

Diagnosis.—This species shares a number of characters with *N. yanomonoa* and

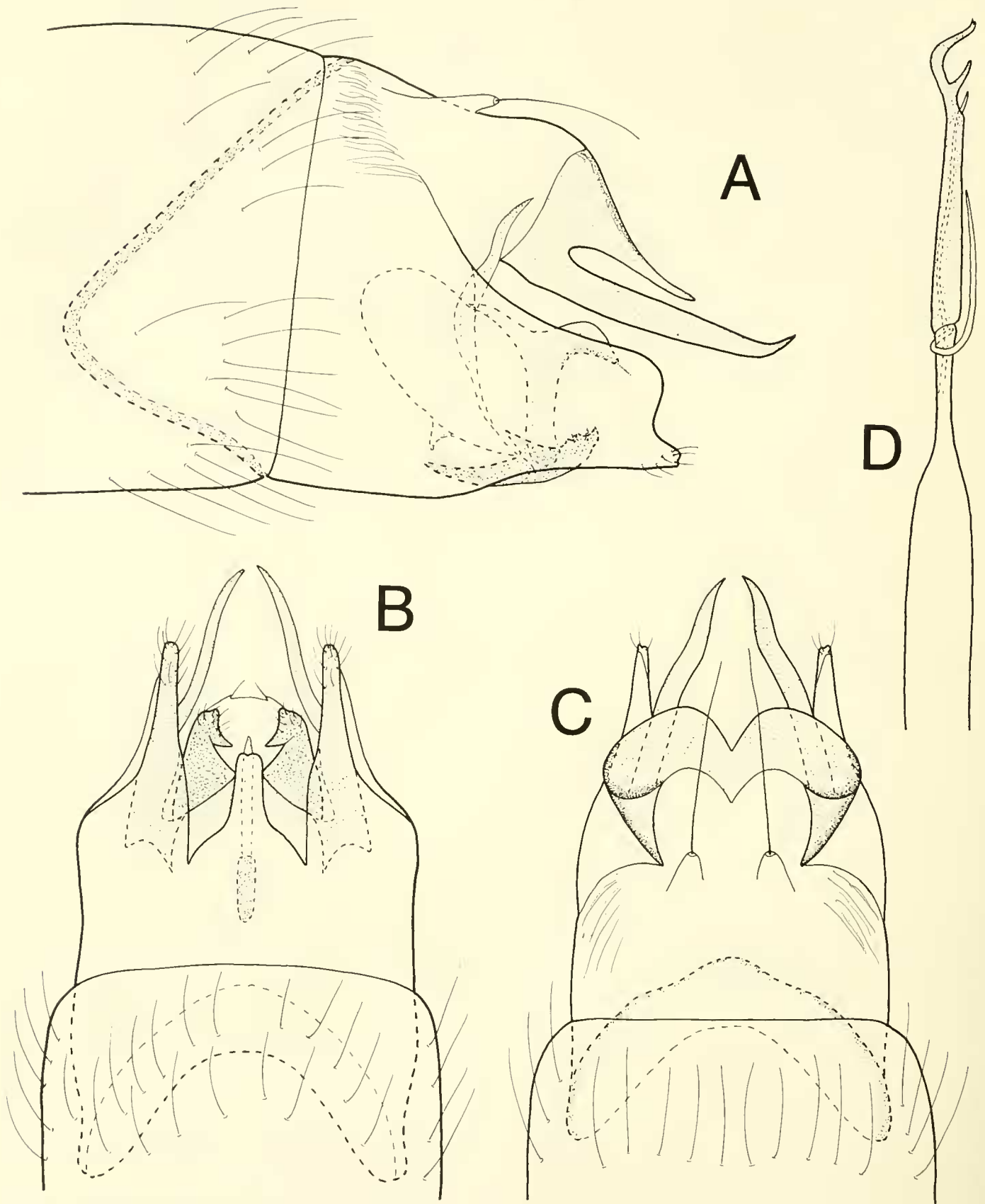


Fig. 2. *Neotrichia yanomonoa*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, lateral view.

*N. browni* from Venezuela, including a phallus with a hook-like apex, thin elongate extensions from the dorsolateral margin of the ninth segment and a truncate projection

from the posteroventral margin. *Neotrichia cayada* is readily separated on the basis of the truncate inferior appendages and structure of the subgenital plate, as well as by the

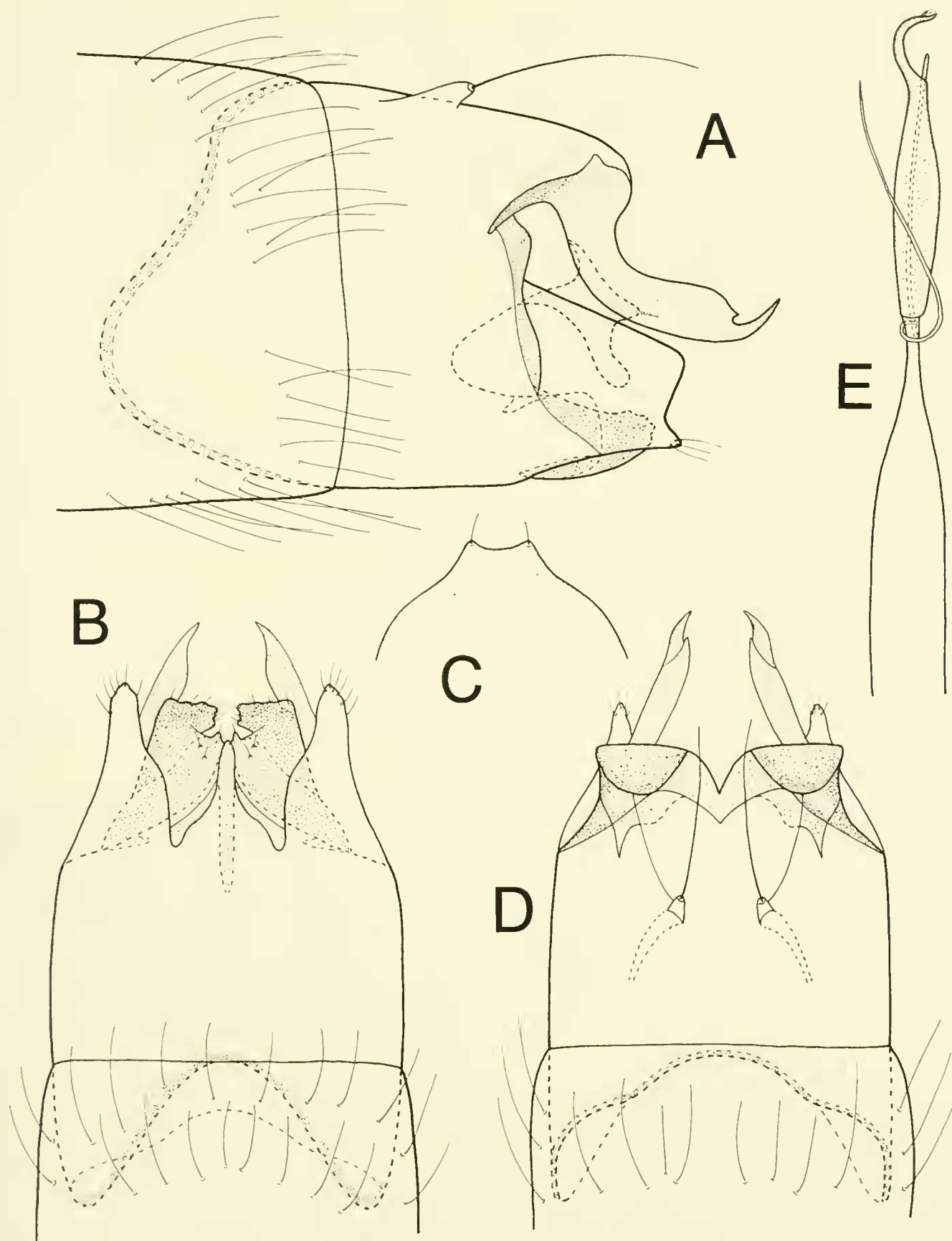


Fig. 3. *Neotrichia cayada*, male genitalia; A. Lateral view, B. Ventral view, C. Distal portion of subgenital plate, ventral view, D. Dorsal view, E. Phallus, lateral view.

configuration of the dorsal processes of the ninth segment.

Description.—*Male*: Length 1.3–1.5 mm. 18 antennal segments. Brown in alcohol.

Ninth abdominal segment in lateral view with anterior margin rounded, posteroventral margin extended into a long, truncate lobe which is incised on the distal margin,

posterodorsal margin bearing elongate sclerotized processes which are acute and upturned apically, in dorsal view these processes are narrow and slightly convergent; square in ventral view with lateral extensions wide basally, tapering to rounded apices. Segment X fused with IX, in dorsal view with pair of sclerotized truncate lobes, pair of small setiferous lobes anteriorly. Inferior appendages darkly sclerotized, short and narrow in lateral view, rounded distally; in ventral view rectangular in overall appearance, incised on apicomeres margins. Subgenital plate in ventral aspect, rounded laterally, bilobed distally, each small lobe bearing stout seta; in lateral view incised on posterior margin to form elongate ventral projection and dorsal seta-bearing shelf. Phallus with distal portion sclerotized and tapering apically to narrow hook, ejaculatory duct protruding in bend of hook, basal portion wide at base, narrowing apically, bearing thin paramere encircling shaft.

Type material.—Holotype; Male. Venezuela, Territorio Federal Amazonas, Cerro de la Neblina basecamp, 0°50'N, 66°10'W near Rio Baria, 140 m, 10 February 1985, W. E. Steiner. Paratypes. Same data as holotype, 6 ♂, same locality, but 14 February 1985, 2 ♂.

Etymology.—Spanish for shepherd's crook, referring to the distinctive phallus.

*Neotrichia delgadeza* Harris,

NEW SPECIES

Fig. 4

Diagnosis.—In most respects, this species is similar to *N. filifera* Flint. Both species have the distinctive elongate processes from the dorsum of segment IX. The new species is distinguished by narrow inferior appendages and unmodified subgenital plate.

Description.—*Male*: Length 1.4–1.7 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior and posterior margins rounded, posterodorsally bearing elongate, thin processes which curve ventrad and extend

beyond the inferior appendages, crisscrossing in dorsal view; thin, elongate bracteoles posteroventrally, in ventral view thin and slightly sinuate distally. Segment X elongate in lateral view, tapering distally; in dorsal view flared laterally near middle, truncate apically. Inferior appendages long, narrow and nearly parallel-sided in lateral view; in ventral view thin and tapering distally, slightly convergent apically. Subgenital plate in lateral view thin and elongate, bearing stout seta subapically; in dorsal view bifid distally, each narrow lobe with seta subapically on mesal margin. Phallus tubular, thin paramere encircling shaft before midlength.

Type material.—Holotype; Male. Ecuador, Pastaza, Tzapino, 400 m, 22 May 1976, J. Cohen. Paratypes. Same data as holotype, 9 ♂.

Etymology.—Spanish, thinness, referring to the appearance of the inferior appendages.

*Neotrichia sucusaria* Harris and Davenport,  
NEW SPECIES

Fig. 5

Diagnosis.—As with *N. delgadeza*, this species is very similar to *N. filifera*. It is readily distinguished by the sclerotization and shape of the inferior appendages.

Description.—*Male*: Length 1.5–1.7 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior and posterior margins rounded, posterodorsally bearing elongate, thin, sinuate processes which extend beyond the inferior appendages and crisscross in dorsal view; narrow, elongate bracteoles posteroventrally, in ventral view, thin and slightly curving mesad. Segment X elongate, tapering distally in lateral view; in dorsal view flared outward near base, then narrowing to truncate apex. Inferior appendages heavily sclerotized, narrow and elongate in lateral view, curving slightly upward, dorsal margin with sclerotized points apically and at midlength; in ventral view narrow, tapering distally to rounded apex, incised on mesal

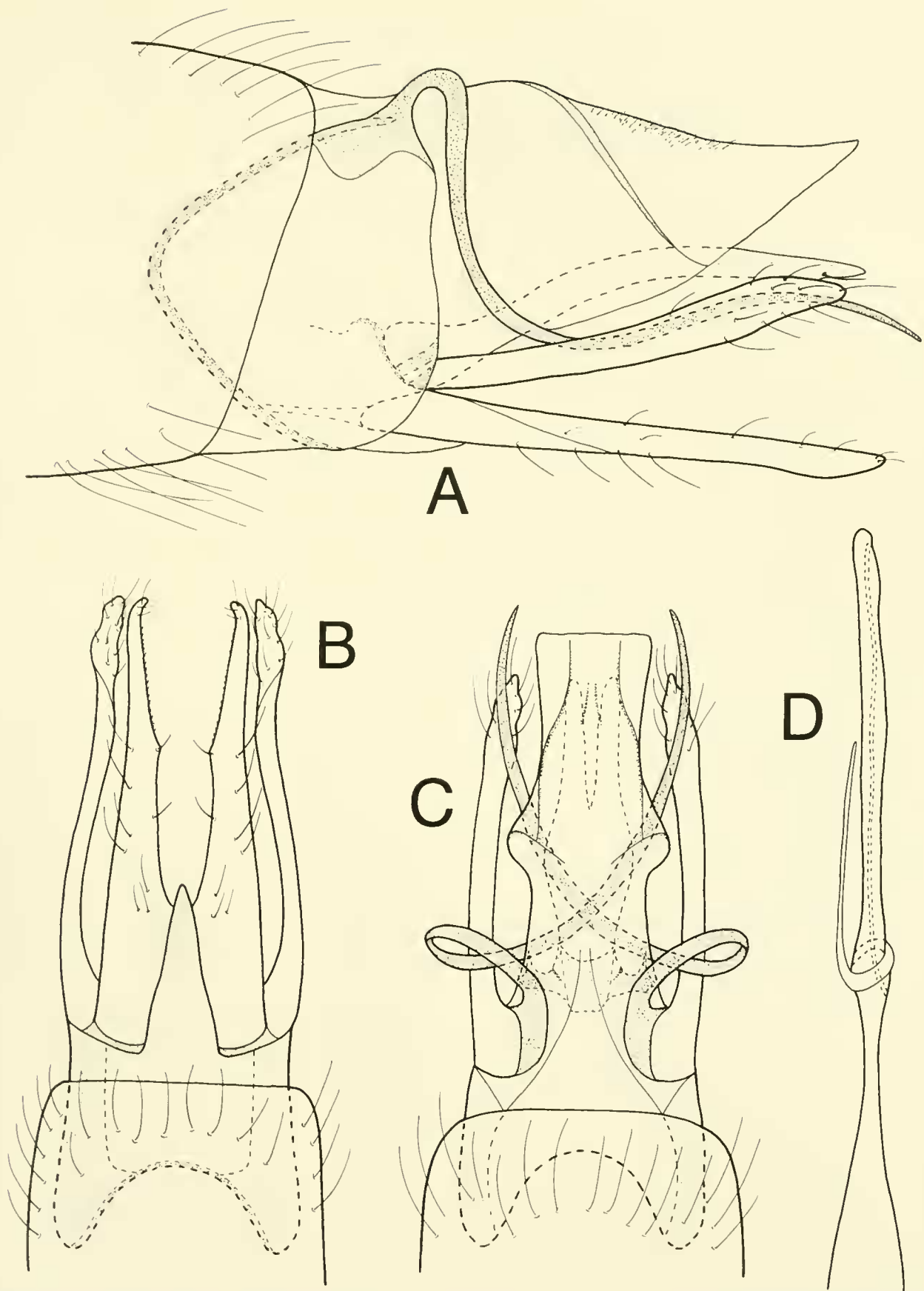


Fig. 4. *Neotrichia delgadeza*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, dorsal view.

margins to form acute points subapically and at midlength. Subgenital plate in lateral view thin and elongate, bearing stout seta apically; in dorsal view bifid apically, each

narrow lobe with seta subapically. Phallus tubular, thin paramere encircling shaft before midlength.

Type material.—Holotype; Male. Peru,

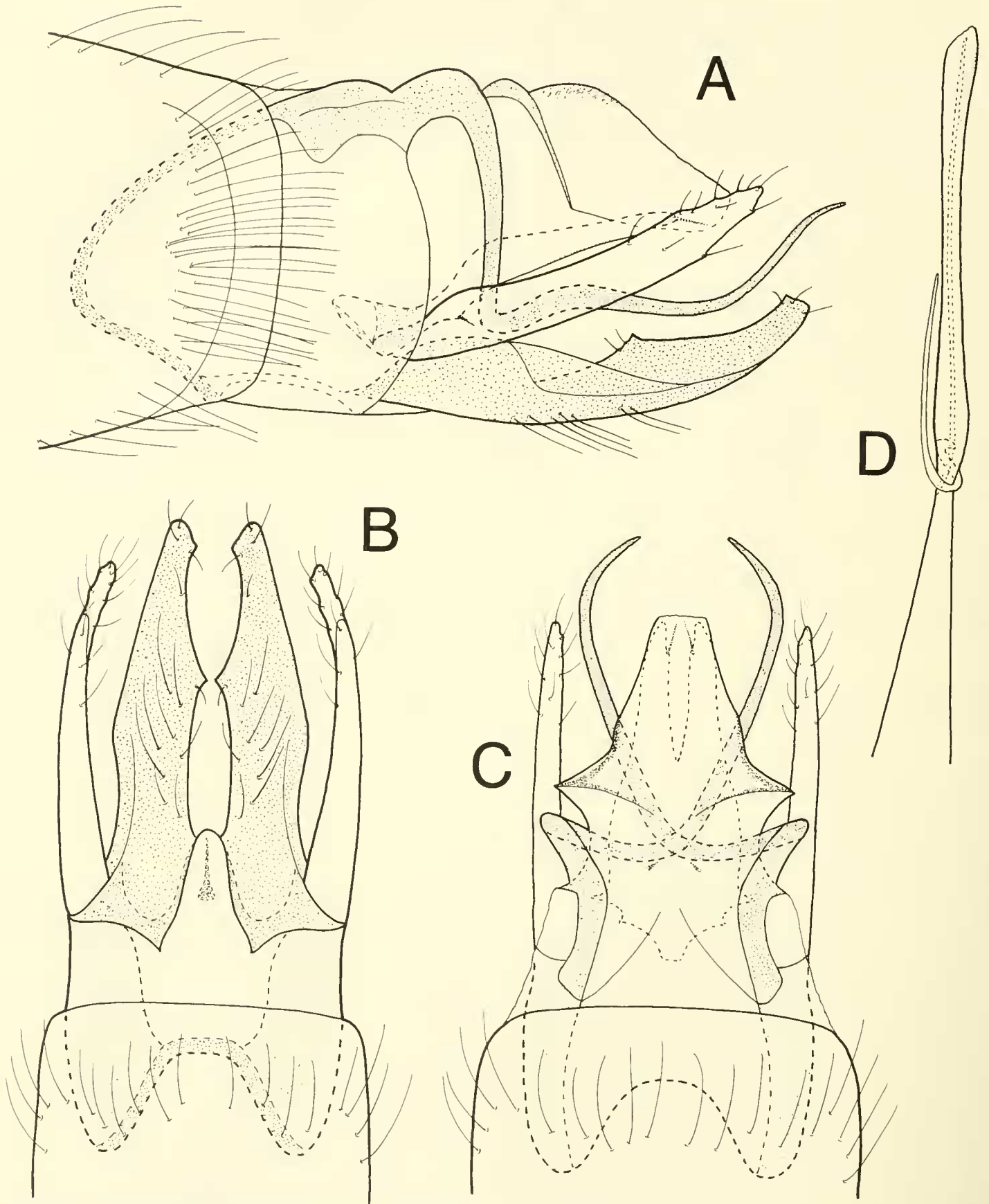


Fig. 5. *Neotrichia sucusaria*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, dorsal view.

Loreto, Rio Sucusari just upstream from Explornapo Camp, 16 January 1991, L. J. Davenport. Paratype. Peru, Loreto, small tributary to Rio Sucusari at Explornapo Camp, 17 January 1991, L. J. Davenport, 1 ♂.

**Etiology.**—Named for the Rio Sucusari.

*Neotrichia napoensis* Harris,

NEW SPECIES

Fig. 6

**Diagnosis.**—Along with the two preceding species, *N. napoensis* is closely related to *N. filifera*. However, unlike the last two species which were readily separated on the basis of the inferior appendages, this character is similar in *N. napoensis* and *N. filifera*. The new species is best distinguished by the structure of the subgenital plate, which lacks the ventral sclerotized processes seen in *N. filifera*.

**Description.**—*Male*: Length 1.8 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior and posterior margins rounded, posterodorsally bearing elongate, thin, sinuate processes which extend beyond the inferior appendages, crisscrossing in dorsal view; narrow, elongate bracteoles posteroventrally, nearly parallel-sided over length, in ventral view thin and curving outward. Segment X elongate, widening distally in lateral view; in dorsal view flared laterally near middle, truncate posteriorly with several membranous folds. Inferior appendages thin in lateral view, widest near base, tapering to narrow apex; in ventral view thin and tapering distally, slightly divergent apically. Subgenital plate narrow and elongate in lateral view, sclerotized basally, bearing stout seta subapically; in dorsal view bifid distally, each narrow lobe with subapical seta on mesal margin, sclerotized basally forming narrow lateral bands. Phallus tubular, thin paramere encircling shaft before midlength.

**Type material.**—Holotype; Male. Ecuador, Napo, 7 km N Lago Agrio, 27 September 1975, A. Langley.

**Etiology.**—Named for the state of Napo.

*Neotrichia filifera* Flint

Fig. 7

*Neotrichia filifera* Flint, 1983: 46.

**Diagnosis.**—*Neotrichia filifera*, with *N. napoensis*, *N. delgadeza* and *N. sucusaria* form a closely related group. All have several prominent features in common including elongate, thin processes from the posterodorsal margin of segment IX, a simple tubular phallus, elongate narrow bracteoles and thin, elongate subgenital plate. *Neotrichia delgadeza* and *N. sucusaria* are readily distinguished by the inferior appendages; sclerotized and wide in *N. delgadeza* and very thin and elongate in *N. sucusaria*. As well, both of these species have a subgenital plate lacking extensive sclerotization basally. *Neotrichia filifera* and *N. napoensis* are less easily separated. In features of the inferior appendages they are similar, however they differ in the structure of the subgenital plate. Although both species have extensive sclerotization basally, *N. napoensis* lacks the ventral finger-like processes seen in *N. filifera*. They are geographically distinct as well, with *N. filifera* only known from Uruguay, and *N. napoensis* from Ecuador.

**Redescription.**—*Male*: Length 1.8 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior margin rounded, posterodorsally bearing elongate, thin processes curving ventrad and extending beyond inferior appendages; narrow elongate bracteoles posteroventrally, slightly widening distally, in ventral view thin, only slightly tapering posteriorly. Segment X elongate, widening distally in lateral view; in dorsal view flared laterally near midlength, truncate posteriorly. Inferior appendages thin in lateral view, widest near base, tapering to narrow apex;



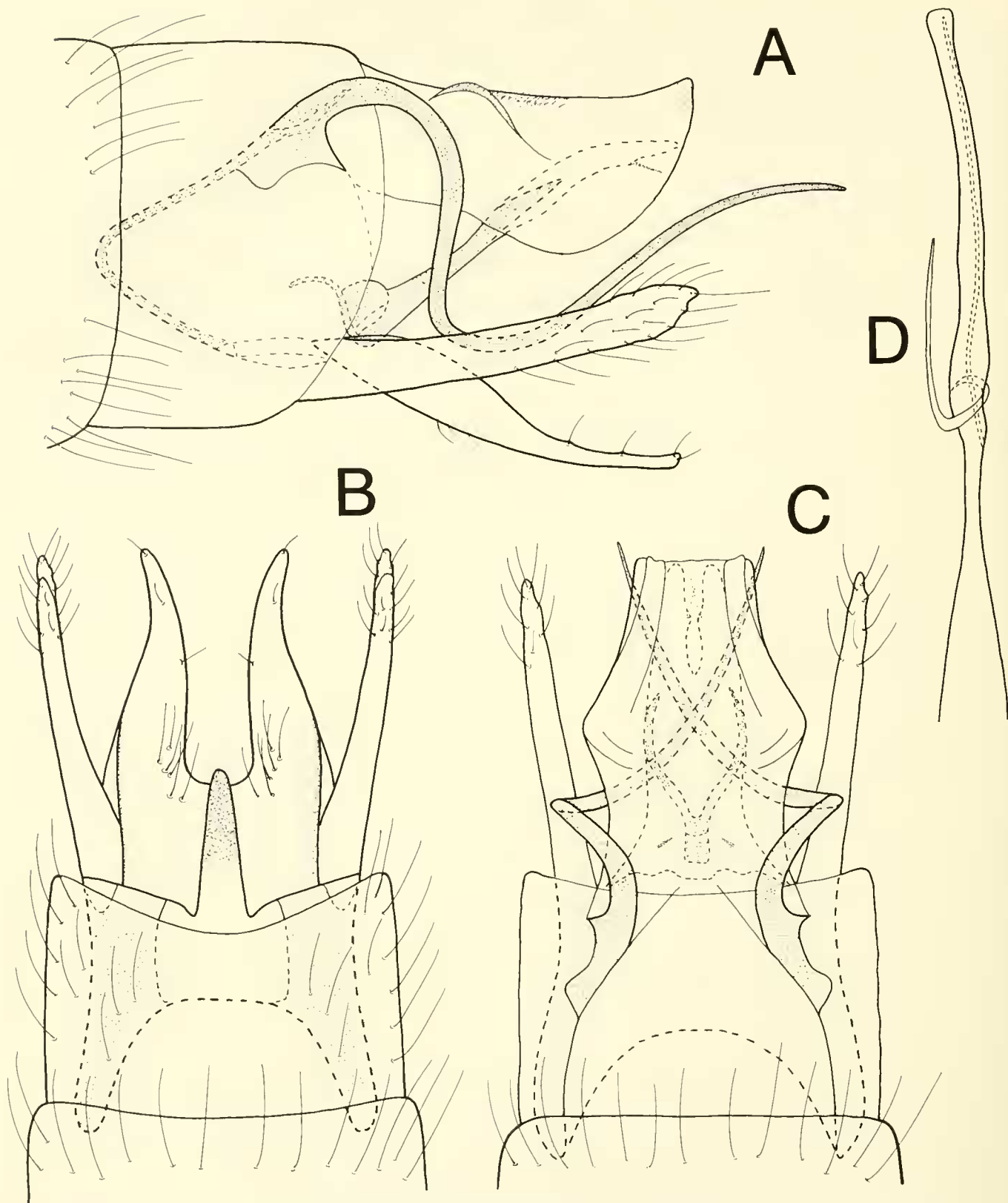


Fig. 6. *Neotrichia napoensis*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, dorsal view.

in ventral view wide basally, tapering posteriorly to thin, rounded apex. Subgenital plate narrow and elongate in lateral view, sclerotized basally with pair of thin processes projecting ventrad, subapically bearing stout seta; in dorsal view bifid distally, each narrow lobe with subapical seta on

mesal margin, sclerotized basally forming narrow lateral bands. Phallus tubular, thin paramere encircling shaft before midlength.

Specimen examined.—Holotype; Male. Uruguay, Dpto. Lavalleja, Rio Cebollati, Picada de Rodriguez, 28 February 1958, C. S. Carbonell. NMNH, Type 100514.

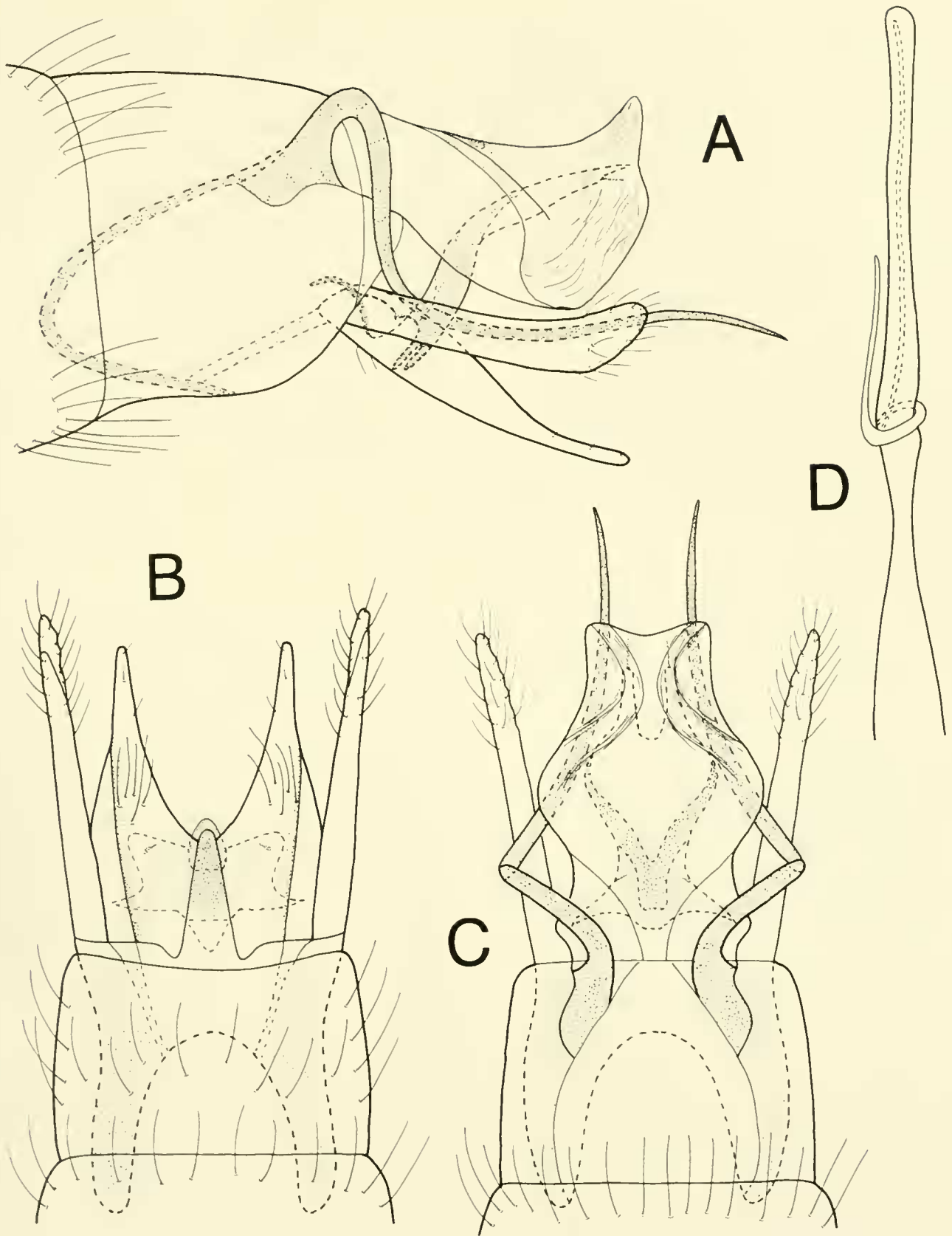


Fig. 7. *Neotrichia filifera*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, dorsal view.

***Neotrichia yagua* Harris and Davenport,  
NEW SPECIES**

Fig. 8

Diagnosis.—In many aspects, *N. yagua* is atypical of *Neotrichia*. The species is considerably larger than other *Neotrichia* and

the simple phallus lacks the paramere which encircles the shaft in most of the species.

Description.—*Male*: Length 2.5–2.8 mm. 28 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior margin tapering and extending

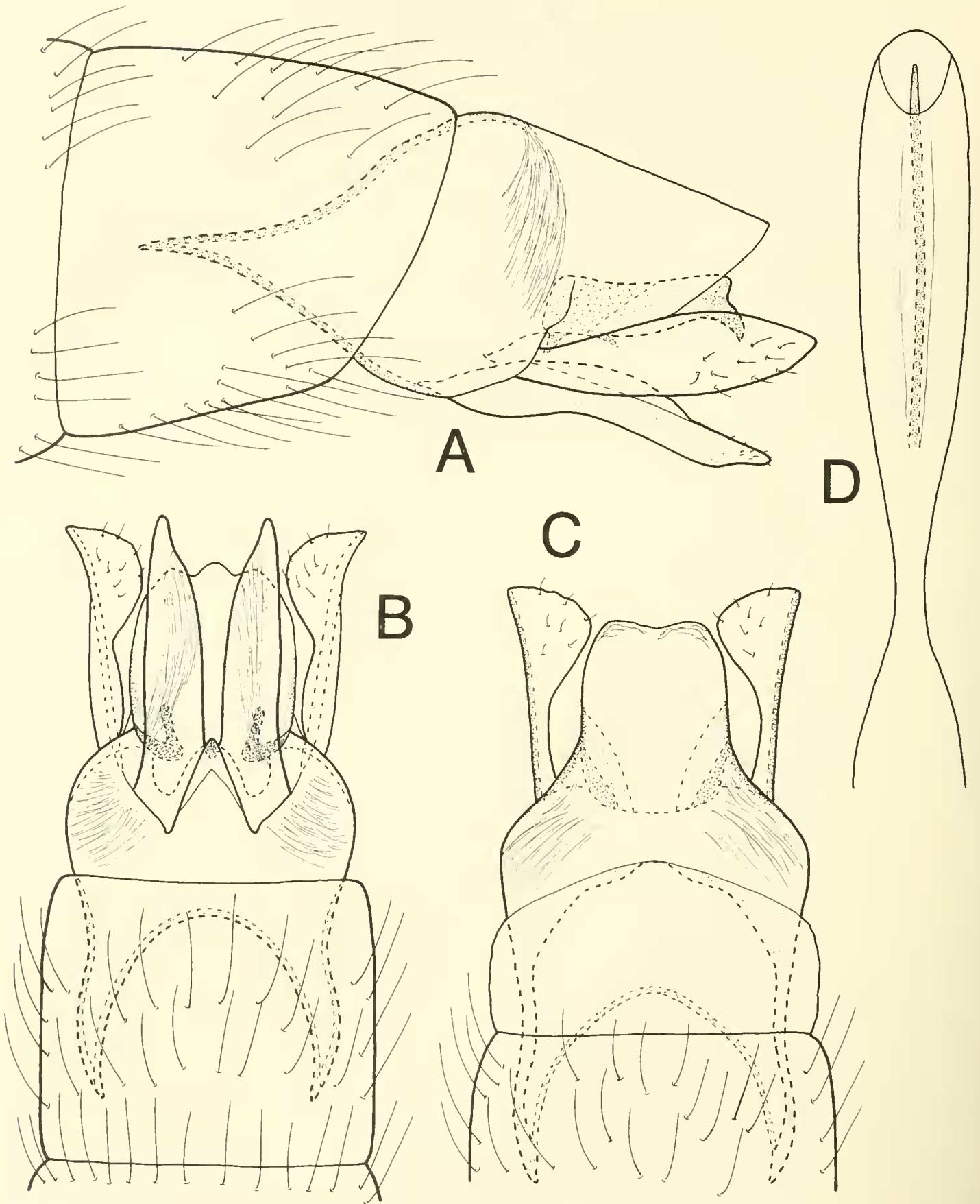


Fig. 8. *Neotrichia yagua*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, ventral view.

nearly through segment VIII, posteriorly fused with X; elongate bracteoles postero-ventrally, narrow at base and apex, in dorsal and ventral views narrow basally, widening

to club-like apex. Segment X elongate and tapering distally in lateral view; in dorsal view square in shape. Inferior appendages lightly sclerotized, elongate and thin in lat-

eral view, tapering to rounded apex; in ventral view thin and tapering apically, narrowly separated basally, slightly divergent distally. Subgenital plate in lateral view thin and elongate, acute ventral projection apically; in ventral view square in shape with small mesal lobe on posterior margin. Phallus tubular, narrowing near base then widening distally to rounded apex, elongate spine centrally, protruding apically.

Type material.—Holotype; Male. Peru, Loreto, Rio Sucusari, just upstream from Explornapo Camp, 12 March 1991, L. J. Davenport. Paratypes. Same data as holotype, 2 ♂, same data as holotype, but 16 January 1991, 1 ♂.

Etymology.—Named for the Yagua Indians which inhabit the area.

***Neotrichia juntada* Harris,**

**NEW SPECIES**

Figs. 9, 10

Diagnosis.—The fused inferior appendages readily distinguish *N. juntada*, although the degree of fusion varies between the series of specimens taken from Peru and Venezuela. The apex of the phallus is also different in the two series, but the basic genitalic plan is the same.

Description.—*Male*: Length 1.5–2.5 mm. 18 antennal segments. Brown in alcohol. Ninth abdominal segment in lateral view with anterior margin tapering and extending through segment VIII, truncate posteriorly; bracteoles posteroventrally, narrow basally and widening apically in lateral view, in ventral view narrow basally, tapering distally to rounded apex. Segment X narrowed posteriorly in lateral view; in dorsal view square in shape, posterior margin slightly incised. Inferior appendages in lateral view wide basally, tapering distally to narrow, slightly upturned apex; fused basally in ventral aspect, pointed apex slightly divided in series from Peru, divided to near midlength in series from Venezuela. Subgenital plate in lateral view thin and elongate, ventral seta subapically; in ventral view divided into

two thin lateral arms each narrowing at apex, with seta on mesal margin. Phallus tubular, wide basally, narrow to midlength, apical portion with sclerotized lateral process, central tube incised apically in series from Peru, narrowing to acute point in series from Venezuela.

Type material.—Holotype; Male. Peru, Loreto, tributary to Rio Yanomono at Explororama Lodge, 11 March 1991, L. J. Davenport. Paratypes. Same data as holotype, 14 ♂; same locality, but 10 March 1991, 3 ♂, Rio Sucusari just upstream from Explornapo Camp, 12 March 1991, L. J. Davenport, 22 ♂. Venezuela, Territorio Federal Amazonas, Rio Cataniapo, 10 km S Puerto Ayacucho, 9 March 1984, O. S. Flint, Jr., 3 ♂.

Etymology.—Spanish, joined or united, referring to the fused inferior appendages.

***Oxyethira orellanai* Harris and Davenport,**

**NEW SPECIES**

Fig. 11

Diagnosis.—On the basis of the elongate ninth segment, this species is placed in the *Tanytrichia* subgenus of Kelley (1984). The short, acute processes which comprise the inferior appendages and venter of segment IX are distinctive for *O. orellanai*.

Description.—*Male*: Length 1.8 mm. 31 antennal segments. Brown in alcohol. Venter of segment VII with short apicomeral process. Segment VIII narrow in lateral view, rounded posteriorly, thin posterodorsally; anterior and posterior margins with mesal incision in dorsal and ventral aspects. Segment IX in lateral view, thin and elongate anteroventrally extending into segment V, truncate posterodorsally, tapering to an acute apex distally, in ventral aspect a mesal acute point posteriorly. Segment X membranous, narrow in dorsal view, rounded apically. Inferior appendages in lateral and ventral views short and acutely triangular. Subgenital plate narrow in lateral view, bending ventrad anteriorly, tapering posteriorly to acute apex; in ventral view wide and rec-

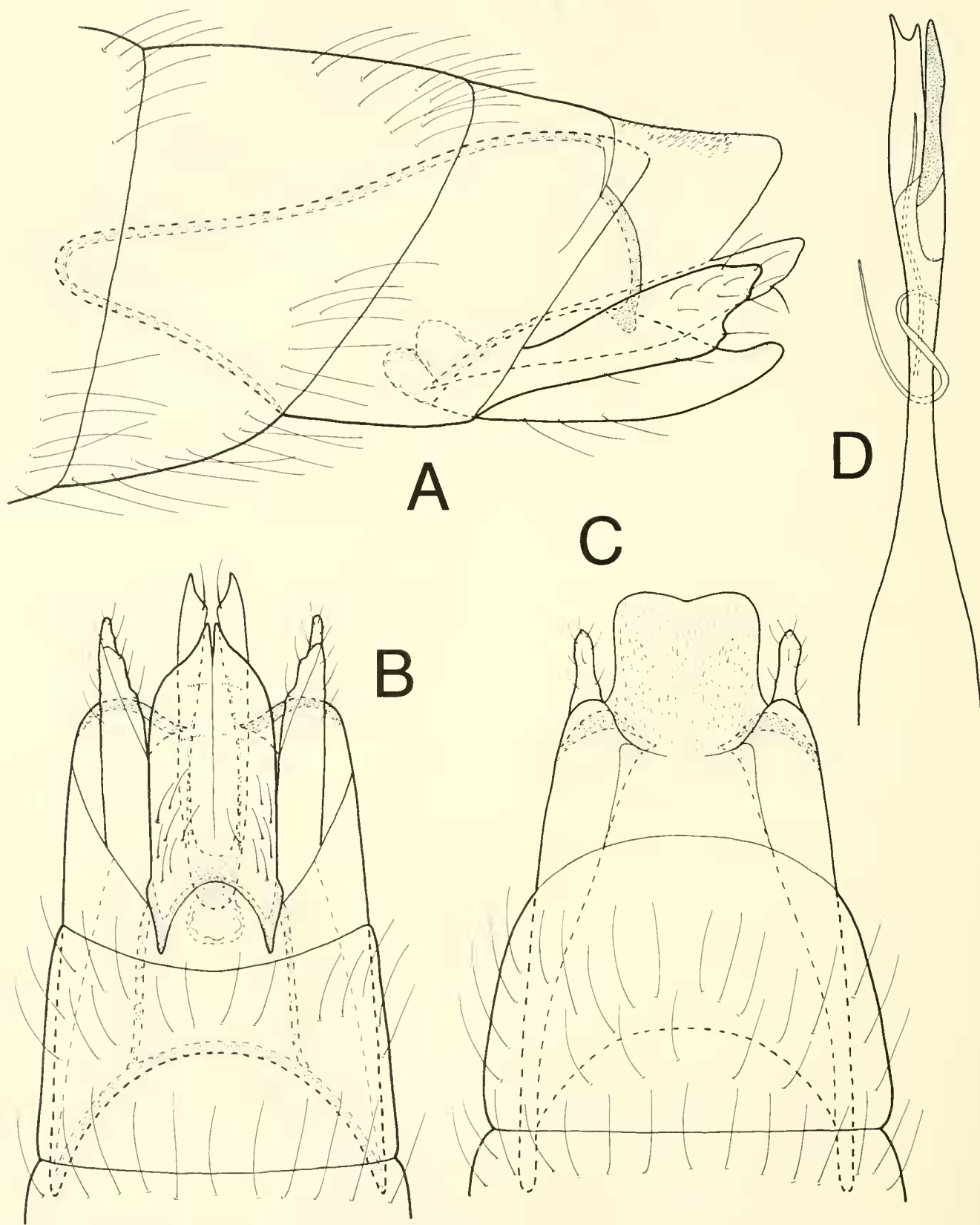


Fig. 9. *Neotrichia juntada*, paratype from Peru, male genitalia; A. Lateral view, B. Ventral view; C. Dorsal view, D. Phallus, dorsal view.

tanguloid. Bilobed process with arms widely separated in ventral view. Phallus thin and tubular with sclerotized sheath-like process encircling shaft posteriorly.

Type material.—Holotype; Male. Peru, Loreto, Rio Sucusari just upstream from

Explornapo Camp, 12 March 1991, L. J. Davenport.

Etymology.—Named for Spanish explorer Francisco de Orellana, who in 1541 made the first descent of the Amazon River by way of the Rio Napo.

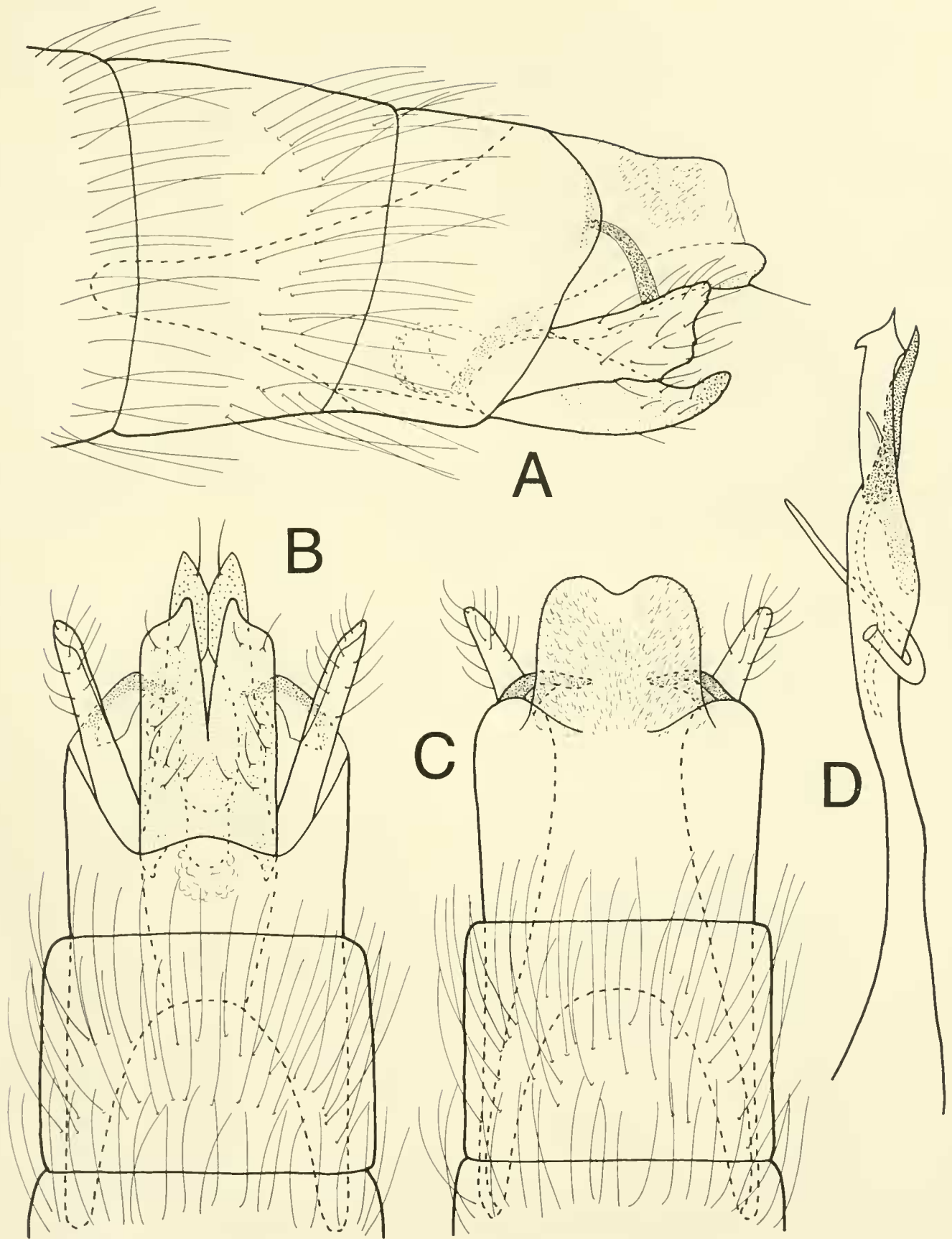


Fig. 10. *Neotrichia juntada*, paratype from Venezuela, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, dorsal view.

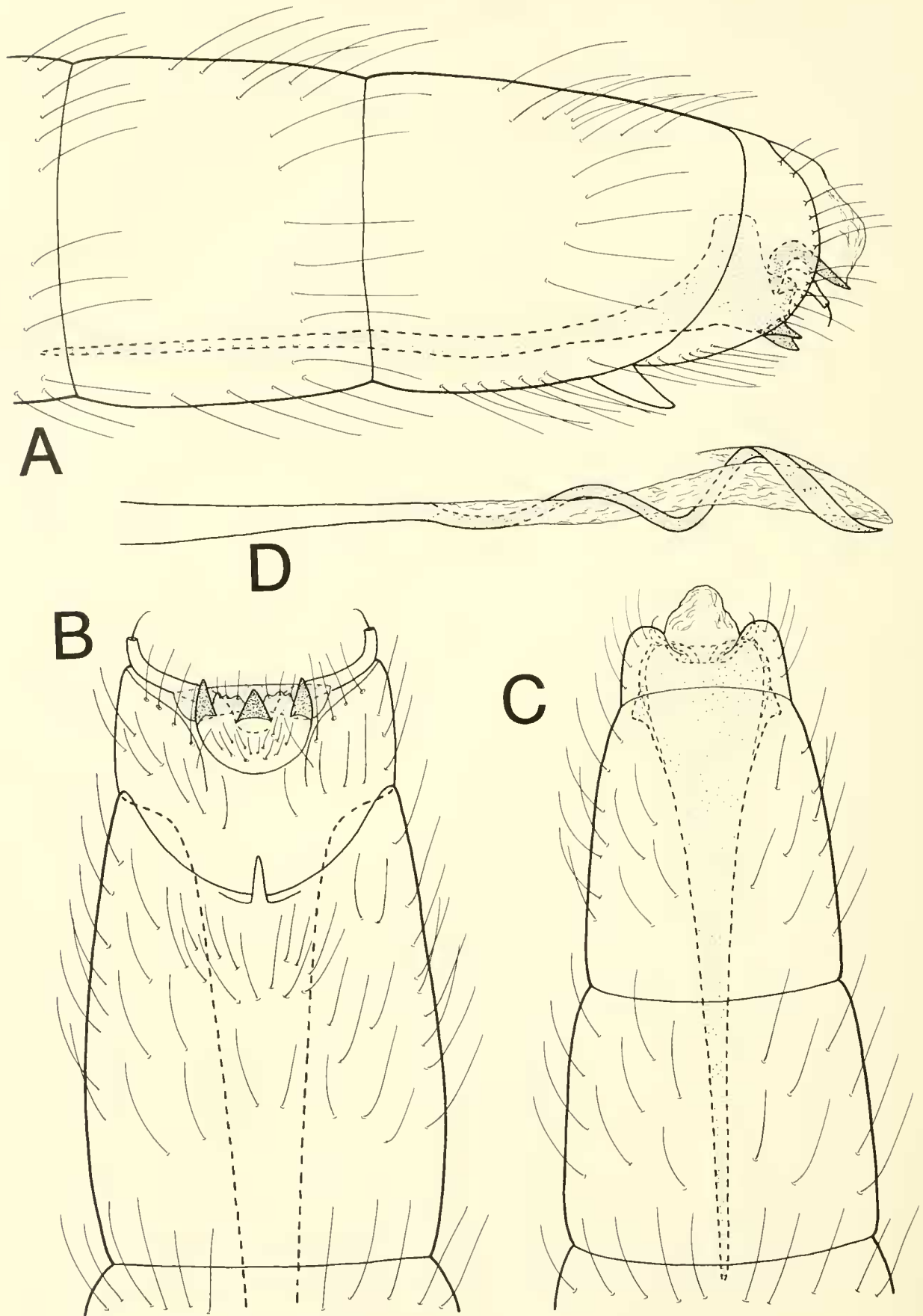


Fig. 11. *Oxyethira orellanai*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, lateral view.

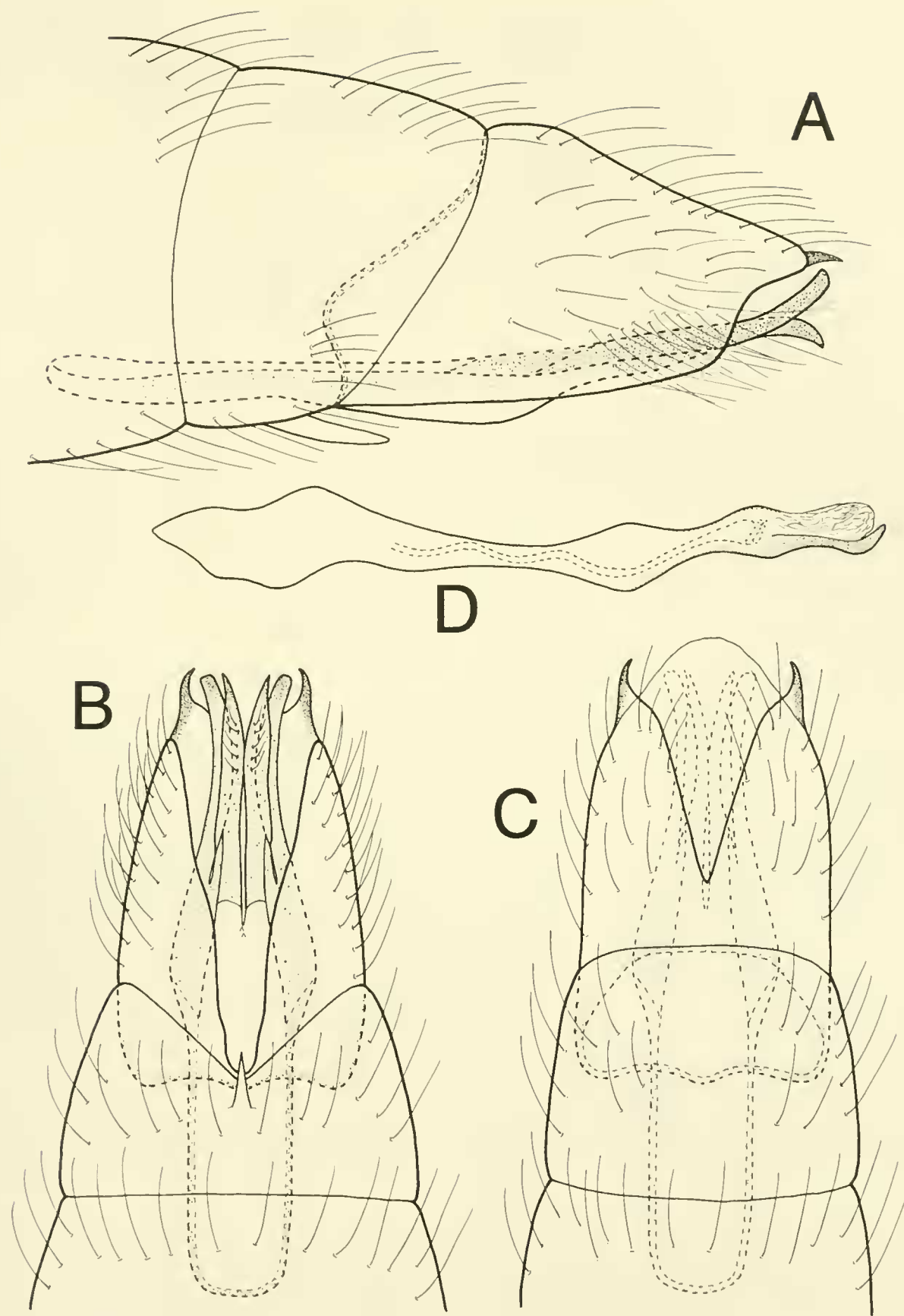


Fig. 12. *Oxyethira teixeirai*, male genitalia; A. Lateral view, B. Ventral view, C. Dorsal view, D. Phallus, lateral view.



*Oxyethira teixeirai* Harris and Davenport,

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Fig. 12

Diagnosis.—On the basis of the elongate narrow segment IX, *O. teixeirai* seems to fall in the *Tanytrichia* subgenus of Kelley (1984) with some similarity to *O. longissima* Flint. The species is distinguished by the simplistic genitalia and the lack of a subgenital plate and bilobed process.

Description.—*Male*: Length 2.5 mm. 30 antennal segments. Brown in alcohol. Venter of abdominal segment VII with short apicomesal process. Segment VIII in lateral view narrowing posterodorsally and tipped with stout spine; deeply incised in ventral and dorsal views, dorsolateral margins narrowed to acute apex. Segment IX thin in lateral view extending anteriorly into segment VI, posteriorly sclerotized and thin, curving dorsad apically; in ventral view divided into two long, thin lateral arms, curving laterad apically. Segment X membranous, rounded apically in dorsal aspect. Inferior appendages sclerotized and thin in lateral view, curving ventrad apically; in ventral view thin and nearly contiguous over length, pointed apices slightly divergent. Subgenital plate and bilobed process absent. Phallus sinuate, apicoventrally with narrow, sclerotized process.

Type material.—Holotype; Male. Peru, Loreto, small tributary to the Rio Sucusari at Explornapo Camp, 17 January 1991, L. J. Davenport.

Etymology.—Named for Portuguese explorer Pedro Teixeira, who in 1638 made the first ascent of the Amazon River reaching Quito via the Rio Napo.

## ACKNOWLEDGMENTS

Buzz Peavy and staff at International Expeditions helped organize the trip to Peru as did Peter Jenson and staff at Explorama Tours in Iquitos. Funds to attend the International Rain Forest Workshop were provided by a Faculty Development Grant from Samford University. The help of Bob Stiles in organizing many aspects of the expedition is also gratefully acknowledged. O. S. Flint, Jr. of the National Museum of Natural History, Smithsonian Institution kindly provided many of the *Neotrichia* specimens included in this paper as well as the type of *N. filifera*.

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